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EXAMINER

FIALKOWSKI, MICHAEL R

ART UNIT	PAPER NUMBER
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4173

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/596,549	Applicant(s) SISODIA ET AL.	
	Examiner MICHAEL FIALKOWSKI	Art Unit 4173	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and Apparatus of Scheduling Broadcasts In a Self-Organizing Network.

35 USC § 101- Patentable Subject Matter

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1- 10 disclose an invention of patentable subject matter involving a method of steps of scheduling broadcasts in a network. Claims 1-19 disclose devices such as first device and neighboring devices in the network and thus the method is tied to a statutory patentable class (a device able to send and receive broadcast messages). Claim 11 provided the device of method steps in Claim 1. Claim 12 provides the network of devices in the method steps of Claim 1. Claim 13 provides the computer readable program executable on a computer for running the method steps of Claim 1. By providing a method and physical devices that implements the method in claims 1-13, the Applicant satisfied the requirements of 35 USC § 101.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1,2,9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al ("Reliable Delivery of Broadcast Packet in Bluetooth", IEEE), herein referred to as Jang et al, in view of the IEEE Standard 802.15.1-2002, herein referred to as IEEE Standard.

Re claim 1, Jang et al discloses a method of scheduling broadcasts (broadcast packet delivery policy [1119, 2, 5-12] , herein referring to [page #, column, line(s)]) in a self-organizing network (two or more units form a piconet [1119, 2, 25-30]), the method

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comprising the steps of: transmitting a broadcast (broadcast packet) from a first device (master) to its neighboring devices (slaves) [1120, 1, 5-12] in the self-organizing network every period $T_{sub.B}$ (unnamed, broadcast packet is sent every 1250 micro seconds, See Figure 2) , characterized in that the transmission of a broadcast from the first device is skipped [1120, 2, 10-20] if all its neighbors have received the broadcast from the first device during a period $T_{sub.CB}$ (T_{subBRD}) (See Figure 4, Master skips transmission of Broadcast packet 1 when all slaves have received the packet). Jang et al does not explicitly disclose transmitting a broadcast comprising presence information. However, the IEEE Standard teaches of transmitting a broadcast comprising presence information (beacon channel carries messages which slaves use for resynchronization and changing beacon parameters, for example [page 96, section 8.10.8.4.1]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of broadcasts in a self-organizing network to include presence information as taught by the IEEE Standard in the method of Jang et al in order to conform to the IEEE Standard.

Re claim 2, note that Jang et al modified by the IEEE Standard teaches the method characterized in that the transmission of the broadcast comprising presence information from the first device is skipped during a second part of the period $T_{sub.CB}$ (after slaves receive packet, master goes into unicast mode [Jang et al 1121, 1, 10-20]) if all its neighbors have received the broadcast from the first device during a first part of period $T_{sub.CB}$ (See Figure 4 of Jang et al, master Tx line where master sends unicast packets in second part of period T_{subBRD}).

Re claim 9, note that Jang et al modified by the IEEE Standard teaches the method characterized in that T.sub.B (unnamed, broadcast packet is sent every 1250 micro seconds, See Jang et al Figure 2) is less than T.sub.CB (TsubBRD) (See Figure 4 of Jang et al, TsubBRD is longer than the period of the master broadcast packet),.

Re claim 10, note that Jang et al modified by the IEEE Standard teaches the method characterized in that $T_{sub.CB} = N * T_{sub.B}$, where $N \in \mathbb{N}^+$ (See Figure 4 of Jang et al, where master broadcast/unicast packets transmitted are evenly spaced, thus multiplied by an integer yield TsubBRD).

Re claim 11, note that Jang et al modified by the IEEE Standard teaches the device (Bluetooth unit acts as master of the piconet [Jang et al 1119, 2, 25-35]) performing the method as claimed in claim 1 as stated above.

Re claim 12, note that Jang et al modified by the IEEE Standard teaches the self-organizing network (piconet) comprising devices (two or more units sharing the same channel [Jang et al 1119, 2, 25-30]) performing the method as claimed in claim 1 as stated above.

Re claim 13, note that Jang et al modified by the IEEE Standard teaches the computer program product comprising a program of computer instructions for making a programmable computer perform the method as claimed in claim 1 as stated above (Jang et al teaches of using a simulation and providing numerical results which would inherently include a computer program to execute the method of Claim 1 [Jang et al 1121-1122]) .

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5. Claims 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al in view of the IEEE Standard as set forth in claim 1 above, and further in view of Elliott et al (2003/0128690) .

Re claim 3, Jang et al modified by the IEEE Standard teaches the method of claim 1 as stated above, and further teaches of a broadcast comprising presence information transmitted from a device (IEEE Standard [page 96, section 8.10.8.4.1]), but does not explicitly teach information on whether the device has received a broadcast from each device in a list of neighboring devices. However, Elliott et al teaches of information (cluster head beacon) on whether the device has received a broadcast from each device in a list of neighboring devices (includes status of the node, organizational affiliation and cluster member list, paragraph [0048-0053] and Figure 3). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of broadcast messages in a self-organizing network to include information on whether the device has received a broadcast as taught by Elliot et al in the method of Jang et al modified by the IEEE Standard in order to inform the nodes of the pattern of connections (Elliot, See paragraph [0047]) and to remove redundant broadcasts.

Re claim 4, note that Jang et al modified by the IEEE Standard and Elliott et al teaches the method characterized in that the broadcast transmitted from the device comprises a skip broadcast bit (1-bit ARQN field [Jang 1120, 1, 1-5]), which is set if a broadcast comprising presence information has been received from each device in the list of neighboring devices in the current T.sub.CB (is used to inform the source of a successful transfer of payload data [Jang 1120, 1, 1-5]).

Re claim 5, note that Jang et al modified by the IEEE Standard and Elliot et al teaches the method characterized in that the broadcast transmitted from the device comprises a skip broadcast bit, which is set if both of the following conditions are met: $(t_{\text{sub.CB}(i), \text{next}} - t)$ is greater than $T_{\text{sub.B}}$ (In Figure 4 of Jang et al, the next master broadcast packet (packet 2) is not sent until many unicast packets have been sent, so following the equation: $T_{\text{sub.BRD}}(\text{next})$ (the time when broadcast packet 2 is sent) minus t (the time when the first unicast packet is sent) is greater than $T_{\text{sub.B}}$ (the time of one period of broadcast packet)) ;

a broadcast comprising presence information has been received from each device in the list of neighboring devices in the current $T_{\text{sub.CB}}$ (In Figure 4 of Jang et al, after the third broadcast packet is sent, it does not need to send a fourth broadcast due to the other slaves having received the packet) , where $t_{\text{sub.CB}(i), \text{next}}$ is the next instant in time, at which the device is arranged to check from which devices it has received broadcasts comprising presence information and t is the current time.

Re claim 6, note that Jang et al modified by the IEEE Standard and Elliott et al teaches the method, characterized in that the device will skip a broadcast if all broadcasts comprising presence information from devices in the list of neighboring devices in the current period $T_{\text{sub.CB}}$ have the skip broadcast bit set (all slaves either send a short packet or no packet to indicate they have received the broadcast, which is an indication at the master to skip a broadcast [Jang et al 1121, 1, 3-19], and Figure 4 of Jang et al for the response of slaves) .

Re claim 7, note that Jang et al modified by the IEEE Standard teaches the method, characterized in that the device will skip a broadcast if both of the following conditions are met:

all broadcasts comprising presence information from devices in the list of neighboring devices in the current period $T_{sub.CB}$ have the skip broadcast bit set (all slaves either send a short packet or no packet to indicate they have received the broadcast, which is an indication at the master to skip a broadcast [Jang et al 1121, 1, 3-19], and Figure 4 of Jang et al for the response of slaves);

$(t_{sub.CB(j),next}-t)$ is greater than $T_{sub.B}$, (In Figure 4 of Jang et al, the next master broadcast packet (packet 2) is not sent until many unicast packets have been sent, so following the equation: $T_{subBRD}(next)$ (the time when broadcast packet 2 is sent) minus t (the time when the first unicast packet is sent) is greater than T_{subB} (the time of one period of broadcast packet)) where $t_{sub.CB(j)}$, next is the next instant in time, at which the device is arranged to check from which devices it has received broadcasts comprising presence information and t is the current time.

Re claim 8, note that Jang et al modified by the IEEE Standard teaches the method characterized in that a device will skip a broadcast if $(t_{sub.CB(j)}, next-t)$ is greater than $T_{sub.B}$ (In Figure 4 of Jang et al, the next master broadcast packet (packet 2) is not sent until many unicast packets have been sent, so following the equation: $T_{subBRD}(next)$ (the time when broadcast packet 2 is sent) minus t (the time when the first unicast packet is sent) is greater than T_{subB} (the time of one period of broadcast packet)), and if one of the following conditions is met:

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all broadcasts comprising presence information from devices in the list $N_{sub,j}$ of neighboring devices in the current period $T_{sub,CB}$ have the skip broadcast bit set (all slaves either send a short packet or no packet to indicate they have received the broadcast, which is an indication at the master to skip a broadcast [Jang et al 1121, 1, 3-19], and Figure 4 of Jang et al for the response of slaves)

OR

all broadcasts comprising presence information received from devices in $M_{sub,k}$, where $M_{sub,k} \cup N_{sub,j}$, during the current check beacon period have the skip broadcast bit set AND the devices in $N_{sub,j} \setminus M_{sub,k}$ are not in the "LAST_KNOWN_BEACON" field of any of the broadcasts transmitted from the devices in the list $M_{sub,k}$, where the "LAST_KNOWN_BEACON" field indicates from which device a broadcast comprising presence information has been received at the earliest instant during the current check beacon period $T_{sub,CB}$; $t_{sub,CB}(i)$, next is the next instant in time, at which the device is arranged to check from which devices it has received broadcasts comprising presence information; and t is the current time.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Romans (2002/0016151) is disclosed for using flags in broadcasts and beacons in a wireless communication system.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL FIALKOWSKI whose telephone number is (571)270-5425. The examiner can normally be reached on Monday - Friday 9:30am-7pm EST, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jinhee Lee can be reached on (571)272-1977. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jinhee J Lee/
Supervisory Patent Examiner, Art Unit 4173

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Examiner, Art Unit 4173